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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/800,020	03/15/2004	Tatsuhiko Nonoyama	461-168	6803
23117	7590	01/24/2006	EXAMINER	
NIXON & VANDERHYE, PC 901 NORTH GLEBE ROAD, 11TH FLOOR ARLINGTON, VA 22203			KOSLOW, CAROL M	
			ART UNIT	PAPER NUMBER
			1755	
DATE MAILED: 01/24/2006				

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/800,020	<b>Applicant(s)</b> NONOYAMA ET AL.	
	<b>Examiner</b> C. Melissa Koslow	<b>Art Unit</b> 1755	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-19 is/are pending in the application.  
     4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |  |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>12/21/05, 7/20/04</u> . | 6) <input type="checkbox"/> Other: ____  |

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The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

The Japanese and Chinese references cited in the information disclosure statements of 20 July 2004 and 21 December 2005 have been considered with respect to the provided partial translations. In addition, the Japanese references cited in the information disclosure statements of 20 July 2004 have been considered with respect to the discussion of these references given in the specification.

The Chinese Office action cited in the information disclosure statement filed 21 December 2005 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent listed that is not in the English language. It has been placed in the application file, but the information referred to therein has not been considered.

The disclosure is objected to because of the following informalities: Page 9 of the specification refers to claim 1, which is improper. Page 78, lines 9-18 teach that the ceramic having the formula of claim 1 can be made thermoelectric or ion-conducting by combining the ceramic with a suitable auxiliary component and/or by forming a ceramic having the claimed formula and comprising a suitable second phase. These suitable second phases and/or auxiliary

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components are not disclosed or defined in the specification. Without these compounds and phases being defined, there is a question as to whether there is a sufficient disclosure to support claimed to a thermoelectric or ion-conducting material comprising the ceramic of claim 1. Appropriate correction is required.

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required:

There is no antecedent basis in the specification for the ranges of  $\pm 9\%$  in claims 10 and 12. Pages 18, 19 and 21 teach preferred ranges of  $\pm 7$ ,  $\pm 8\%$  and  $\pm 5\%$ . There is no specific disclosure of the claimed ranges of  $\pm 9\%$ . Applicants can either insert these claimed ranges into the specification or amend these claims so the claimed ranges are one of the preferred ranges in the specification. The Examiner was unable to find antecedent basis for the subject matter of claims 13 and 16-19. Applicants can either point where the claimed subject matter is found in the specification or insert the claimed subject matter into the specification.

Claims 18 and 19 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

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Page 78, lines 9-18 teach that the ceramic having the formula of claim 1 can be made thermoelectric or ion-conducting by combining the ceramic with a suitable auxiliary component and/or by forming a ceramic having the claimed formula and comprising a suitable second phase. The claims imply the claimed ceramic inherently have these properties and do not disclose the suitable second phase and/or auxiliary components. This discrepancy needs to be corrected.

Claims 18 and 19 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. Material critical or essential to the practice of the invention, but not included in the claims means the claims are not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976).

Page 78, lines 9-18 teach that the ceramic having the formula of claim 1 can be made thermoelectric or ion-conducting by combining the ceramic with a suitable auxiliary component and/or by forming a ceramic having the claimed formula and comprising a suitable second phase. These required suitable second phases and/or auxiliary components are not present in these claims.

Claims 2 and 13-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 recites the limitation "the pseudo-cubic {100} plane". There is insufficient antecedent basis for this limitation in this claim or in claim 1. In addition, it is not clear if the pseudo-cubic {100} plane of this claim is the oriented specific crystal plane of claim 1. Claim 13 recites the limitation "the crystal system". There is insufficient antecedent basis for this limitation in the claim or in claim 1. Claims 14 and 15 are confusing as written. They are unclear

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as to composition of the resulting ceramic and the compositions of the first anisotropic powder, in claim 14, and the first reaction raw material.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 14 and 15 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by U.S. patent application publication 2003/0008762.

Claims 14 and 15 are rejected under 35 U.S.C. 102 (a) and 35 U.S.C. 102 (e) as being clearly anticipated by U.S. patent 6,692,652.

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

U.S. patent application publication 2003/0008762 was issued as U.S. patent 6,692,652.

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Examples 6-11 teach forming a crystal or grain orientated ceramic comprising mixing a plate-like powder having the formula  $\text{NaNbO}_3$  having the  $\{100\}$  plane as its growth plane with a non-platelike  $\text{KNbO}_3$  powder, molding the mixture so that the plate-like powder is orientated and heat treating the molded body to form a  $\text{Na}_{0.5}\text{K}_{0.5}\text{NbO}_3$  ceramic in which the  $[100]$  growth plane has lattice coherency with the  $\{100\}$  plane of a compound having the formula of claim 1. The reference clearly teaches the claimed process.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-13 and 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent application publication 2003/0008762.

Claims 1-13 and 16-19 are rejected under 35 U.S.C. 103(a) as being obvious over U.S. patent 6,692,652.

Applicant has provided no evidence in this file showing that the invention was owned by, or subject to an obligation of assignment to, the same entity as U.S. patent 6,692,652 at the time this invention was made, or was subject to a joint research agreement at the time this invention was made. Thus this reference qualifies as prior art under subsections of 35 U.S.C. 102(e) and (a), and therefore, is not disqualified as prior art under 35 U.S.C. 103(c).

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Applicant may overcome the applied art either by a showing under 37 CFR 1.132 that the invention disclosed therein was derived from the invention of this application, and is therefore, not the invention "by another," or by antedating the applied art under 37 CFR 1.131.

U.S. patent application publication 2003/0008762 was issued as U.S. patent 6,692,652.

These references teach crystal or grain oriented ceramics composed of a polycrystalline body of an alkali pentavalent perovskite having the formula  $(\text{Na}_{1-x}\text{K}_x)(\text{Nb}_{1-y-z}\text{Ta}_y\text{Sb}_z)\text{O}_3$ , where  $x$  is 0-1,  $y$  is 0-1 and  $z$  is 0-1, in which the {100} crystal plane of the grain has a degree of orientation, according to the Lotgering method, of 30% or more. This formula encompasses and thus suggests the claimed formula. Product claims with numerical ranges which overlap prior art ranges were held to have been obvious under 35 USC 103. *In re Wertheim* 191 USPQ 90 (CCPA 1976); *In re Malagari* 182 USPQ 549 (CCPA 1974); *In re Fields* 134 USPQ 242 (CCPA 1962); *In re Nehrenberg* 126 USPQ 383 (CCPA 1960). Given the overlap, one of ordinary skill in the art would expect the taught ceramics having the overlapping composition to inherently have the crystal system of claim 13. The examples show that that grain oriented alkali pentavalent perovskite ceramics have a  $d_{31}$  and a  $g_{31}$  at least 1.1 times of these constants in non-orientated alkali pentavalent perovskite ceramics. Given this teaching, one of ordinary skill in the art would expect the suggested ceramics to inherently have improvements rates and differences that fall within the claimed ranges. The references suggest the claimed ceramic.

As stated above, these references suggest the claimed ceramic. Paragraph [0155] and column 23, lines 11-19 teaches the taught grain orientated alkali pentavalent perovskite oxide ceramic, which would have a formula that encompasses the formula of claim 1 are suitable as piezoelectric or dielectric materials and can be modified to have thermoelectric or ion conducting



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properties. One of ordinary skill in the art would have found it obvious to use these taught materials in piezoelectric or dielectric elements and use the modified ceramics as the thermoelectric material in conventional thermoelectric conversion element and as the ion-conducting material in conventional ion conducting elements. The references suggest the claimed ceramic and elements.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melissa Koslow whose telephone number is (571) 272-1371. The examiner can normally be reached on Monday-Friday from 8:00 AM to 3:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo, can be reached at (571) 272-1233.

The fax number for all official communications is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

cmk  
January 20, 2006

  
C. Melissa Koslow  
Primary Examiner  
Tech. Center 1700